

REMARKS

The present Amendment amends claims 1 and 3-11, leaves claim 2 unchanged and adds new claim 12. Therefore, the present application has pending claims 1-12.

Claims 1-4, 7-9 and 11 stand rejected under 35 USC §102(e) as being anticipated by DeKoning (U.S. Patent No. 6,691,245) and claims 5, 6 and 10 stand rejected under 35 USC §103(a) as being unpatentable over DeKoning in view of Wahl (U.S. Patent No. 6,324,654). These rejections are traversed for the following reasons. Applicants submit that the features of the present invention as now more clearly recited in claims 1-11 are not taught or suggested by DeKoning or Wahl whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

Amendments were made to the claims to more clearly recite that the present invention is directed to an external storage, a data recovery method and a program for controlling an external storage and a host computer for recovering data on the external storage.

The external storage according to the present invention can be connected to a host computer and includes storing means which stores data to be used by the host computer and control means which controls the storing means.

The control means includes registering means which registers a recoverable point to be set by the host computer concerning data in the storing means. The recoverable point corresponds to journal data which includes journal control

information having information necessary for recovering data on the storing means to the recoverable point and a recovery flag which is settable by the host computer to indicate that the journal data is a recoverable point.

The control means of the present invention further includes information for selection sending means which sends information for selection related to the journal data at the registered recoverable point to the host computer in response to a request from the host computer and recovering means which recovers data designated by the host computer to a designated recoverable point based on the information related to the journal data for selection at the recoverable point.

Thus, by use of the present invention as described above means is provided in the external storage which can allow it to recover data to any given point in time without increasing the processing load on the host computer.

The above described features of the present invention are accomplished, for example, by providing as illustrated, for example, in Fig. 3 write control information D30 as the journal control information in the journal data D20. According to the present invention a recovery flag D34 is provided in the journal control information which is settable in response to an input by the host computer so as to identify the journal data as a recoverable point. Thus, according to the present invention as now more clearly recited in the claims when a request for a list of recoverable points is issued from the host, the information in which the recovery flag has been set are collected to generate a list of recoverable points which are selectable by the host computer. Once one of the recoverable points have been selected then recovery is

accomplished using the journal data within which the recovery flag has been set corresponding to the recoverable point.

The above described features of the present invention now more clearly recited in the claims are not taught or suggested by any of the references of record whether taken individually or in combination with each other. Particularly, these features are not taught or suggested by DeKoning or Wahl whether taken individually or in combination with each other as suggested by the Examiner.

DeKoning teaches a data storage with host initiated synchronization and failover of remote mirror. Specifically, DeKoning teaches that a mirrored data storage system utilizes a first host processor device and a local storage device for primary data storage and a second host device and a remote storage device for mirrored failover storage on behalf of client devices. DeKoning further teaches that at periodic intervals, called checkpoints, the first host device initiates data synchronization between itself and the two storage devices and issues checkpoint information to ensure that each device maintains information for a common stable storage state. In DeKoning, the local storage device synchronizes a stored data and forwards the checkpoint information to the remote storage device.

In the Office Action the Examiner alleges that the issuing of the checkpoint message from the host device to the primary storage device as taught by DeKoning corresponds to the limitations recited in the claims regarding the registering means which registers a recoverable point to be set by the host computer. Applicants do not agree and submit that the features of the present invention as now more clearly recited in the claims are entirely different from that taught by DeKoning.

DeKoning is concerned with maintaining synchronization between mirrored systems. The present invention is not directed to maintaining synchronization between mirrored systems, but is specifically directed to arbitrarily setting various recoverable points in data with respect to journal data as necessary or by users selection to permit the recovery of data at any arbitrarily point in time. The present invention accomplishes this by upon storing journal data including journal control information, a recovery flag can be set, as desired, by the host computer so as to indicate that the journal data being recorded represents a recoverable point that can be used later for recovering data. According to the present invention when recovery is to be accomplished the host computer can obtain a listing of all of such recoverable points, which have been previously indicated due to the setting of the recovery flags, and permit the user to select a desired one of the recovery points to which recovery is to be accomplished. Such features are clearly not taught or suggested by DeKoning.

At no point is there any teaching or suggestion in DeKoning that journal data is used in the manner as recited in the claims. DeKoning simply teaches that checkpoint messages are passed between the computers so as to initiate synchronization. This checkpoint message as per DeKoning is not journal data as recited in the claims and further this check point message as taught by DeKoning does not include journal control information within which a recovery flag can be arbitrarily set as needed as in the present invention as recited in the claims.

Thus, DeKoning fails to teach or suggest registering means which registers a recovery point to be set by the host computer concerning data stored in the storing

means wherein the recoverable point corresponds to journal data which includes journal control information having information necessary for recovering data on the storing means to the recoverable point and a recovery flag which is settable by the host computer to indicate that the journal data is a recoverable point as recited in the claims.

Further, DeKoning fails to teach or suggest information for selection sending means which sends information for selection related to the journal data at the registered recoverable point to the host in response to a request from the host computer as recited in the claims.

Still further, DeKoning fails to teach or suggest recovering means which recovers data designated by the host computer to a designated recoverable point based on the information for selection related to the journal data at the recoverable point as recited in the claims.

Therefore, DeKoning fails to teach or suggest the features of the present invention as now more clearly recited in the claims. Accordingly, reconsideration and withdrawal of the 35 USC §102(e) rejection of claims 1-4, 7-9 and 11 as being anticipated by DeKoning is respectfully requested.

The above noted deficiencies of DeKoning relative to the features of the present invention as now more clearly recited in the claims are also not taught or suggested by Wahl. Therefore, combining the teachings of DeKoning and Wahl in the manner suggested by the Examiner in the Office Action still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Wahl is merely relied upon for an alleged teaching that the journal data managing means transfers oldest journal data stored in the journal data storing means to the backup data storing means to increase the free space of the journal data storing means. However, even if such were true, at no point is there any teaching or suggestion in Wahl of the above described features of the present invention now more clearly recited in the claims which were shown not to be taught or suggested by DeKoning. Particularly, there is no teaching or suggestion in Wahl of the above described features of the present invention regarding the registering means, information for selection sending means and recovering means as recited in the claims.

More importantly, there is no teaching or suggestion in Wahl that the recoverable point corresponds to journal data which includes journal control information having information necessary for recovering data on the storing means to the recoverable point and a recovery flag which is settable by the host computer to indicate that the journal data is a recoverable point as recited in the claims.

Therefore, since both DeKoning and Wahl suffer from the same deficiencies relative to the features of the present invention as now more clearly recited in the claims, combining DeKoning and Wahl in the manner suggested by the Examiner in the Office Action still fails to teach or suggest the features of the present invention as now more clearly recited in the claims. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 5, 6 and 10 as being unpatentable over DeKoning in view of Wahl is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1-11.

As indicated above, the present Amendment adds new claim 12. New claim 12 recites many of the same features shown above not to be taught or suggested by any of the references of record whether taken individually or in combination with each other. Therefore, the same arguments presented above with respect to claims 1-11 apply as well to new claim 12. Thus, new claim 12 is allowable over the prior art of record for the same reasons as claims 1-11.

In view of the foregoing amendments and remarks, applicants submit that claims 1-12 are in condition for allowance. Accordingly, early allowance of claims 1-12 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (WL-121).

Respectfully submitted,

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